

Using the Kestrel Instrument in the Science Classroom



by Kathy Murphy
Ladue Middle School
St. Louis, MO

Using the Kestrel Instrument in the Science Classroom

TABLE OF CONTENTS

- 1. Keep your head in the clouds.** Sky observations
- 2. A Walk on the Wild Side.** A meteorological scavenger hunt
- 3. The Weather is Right Under Your Nose!** Search for evidence of the various components of the water cycle
- 4. What's Happening with the Weather?** Record surface weather data as it happens!
- 5. Be a Meteorologist for a Day!** Use this script, Kestrel data, and your talent to become the school meteorologist for the day.
- 6. Weather Forecasting Contest Round 1.** Do you think that anybody can predict the weather? How close can you come to getting the actual weather conditions in your predictions?
- 7. Weather Forecasting Contest Round 2.** Who is the best weather forecaster in your area? Compare your data with a local television forecaster.
- 8. Is it Chilly in Here?** Be a science sleuth and discover how the temperature changes throughout your school building.
- 9. Stream Team and Kestrel to the Rescue.** Examine a local stream and evaluate the quality of the stream.
- 10. Weather Data in the REAL World.** How is weather data used in everyday jobs?



Keep Your Head in the Clouds



Make a drawing of the sky around you. Be sure to add labels to the various clouds. (cirrus, cumulus, stratus, nimbostratus, cumulonimbus, etc.)

What do the clouds tell you about what is happening in the sky above you?

What kind of weather can we expect later on?



A Walk on the Wild Side

Microecosystems are very small communities made up of living and non-living things all around us. As you walk around your outdoor classroom, what microecosystems can you find? A microecosystem can be found under a pile of leaves, in a pond, under a log, or in a flower garden. Find four microecosystems around your outdoor classroom. Record data for each place in the charts below.

Site Name/ Description	Site 1	Site 2	Site 3	Site 4
Amount of Sun Low/Medium/High				
Temperature				
Soil Type Rocky/Dirt/Sand				
Moisture Dry/Moist/Wet				
Living Things Plants/Animals				



The Weather is Right Under Your Nose.

It's everywhere! How many examples of weather related phenomena can you find? Take a walk on the wild side. Who can find the most?

REMEMBER TO RESPECT NATURE. LEAVE NOTHING BUT FOOTPRINTS BEHIND.

_____ Some thing that uses the sun to make food

_____ Evidence of rainfall

_____ A good place to seek shelter

_____ Some thing that has been blown by the wind

_____ An example of condensation

_____ A reflector of sunlight

_____ An animal that is influenced by the cold

_____ A place which gets almost no sunshine

_____ A place where evaporation takes place

_____ A good spot for water to run off

_____ A surface where percolation takes place

_____ Some thing that smells worse after rain

_____ A good wind break

What's Happening with the Weather?

Using the Kestrel weather instrument, record the current weather data. You can use this data in your school weather report.

Temperature	
Wind Speed	
Wind Direction	
Humidity	
Barometric Pressure	
Cloud Cover	
Observation	



Be a Meteorologist for a Day!

Good morning _____ School! This is _____
Your school Your name

and I am presenting today's weather. It is a _____ day.
adjective

The temperature is a _____ degrees. The
Adjective number

humidity is _____ at _____ percent.
low/high/moderate number

The barometric pressure is _____ at _____ and it is going
rising/falling/steady number

to be _____ today. The winds are from
clear/cloudy/rainy/stormy

the _____ at _____. So if you have plans after school,
Direction miles per hour

_____.

This has been _____,
Your name school's name

meteorologist of the day. Keep your eyes on the sky!!!



Weather Forecasting Contest 1

How close can you predict tomorrow's weather? Use the scoring guide below to see how close your predictions come to the actual readings found in your local newspaper or broadcast.

Measurement	My Forecast	Actual	Difference
High Temperature	○	○	○
Low Temperature	○	○	○
Rainfall (Yes/No)			
Overall weather (Clear, Stormy, Partly cloudy)			

Measurement	TV Forecast	Actual	Difference
High Temperature	○	○	○
Low Temperature	○	○	○
Rainfall (Yes/No)			
Overall weather (Clear, Stormy, Partly cloudy)			

Scoring: (Remember, low scores are the most accurate!)

Temperatures: Subtract the forecast temperature from actual temperature. Each degree is worth 1 point.

Rainfall: If you are correct, no points. If you are wrong, 5 points.

Overall weather: If you are correct, no points. If you are wrong, 5 points



Weather Forecasting Contest 2

Can you predict weather as well as your local meteorologist? Record predictions for the next day's weather. Use a variety of sources below. Who had the best forecast?

	High Temp	Actual	Difference
Your Prediction			
TV Prediction			
Newspaper Prediction			
Radio Prediction (NOAA weather radio)			

Your prediction	Low Temp	Actual	Difference
TV Prediction			
Newspaper Prediction			
Radio Prediction (NOAA weather radio)			

Your prediction	Rain- Yes/No	Actual	Difference
TV Prediction			
Newspaper Prediction			
Radio Prediction (NOAA weather radio)			

Your prediction	Overall Weather	Actual	Difference
TV Prediction			
Newspaper Prediction			
Radio Prediction (NOAA weather radio)			

Scoring: (Remember that a low score is most accurate.)

Temperatures: Subtract the forecast temperature from actual temperature. Each degree is worth 1 point.

Rainfall: If you are correct, no points. If you are wrong, 5 points.

Overall weather: If you are correct, no points. If you are wrong, 5 points.



Is it Chilly in Here?

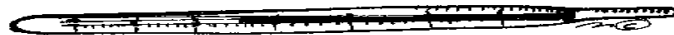
What's it like in your classroom? Is it nice and warm so that you want to sleep in class? Is it so cold that you want to hibernate? Or is it just right and you're ready to learn? Temperatures vary throughout the classroom and throughout your school. As you discover how the temperature changes, put on your detective thinking caps and see if you can figure out why the temperatures are different and/or alike.

Predict: Five places which I think will have big temperature differences are:

Experiment: Take a temperature reading in each of the 5 places. Record your temperature data. Then look for any clues which might explain why the temperatures are different. Record your clues.

Place	Temperature	Clues

Report: Share your findings with your class. Discuss your clues. What did you learn from your research? (Continue on the back if you need more space.)





Stream Team & Kestrel to the Rescue

Stream _____ County _____

Trained Testers _____

Site # _____ Description _____

Test / Measurement type	Data (units)
Date	
Time	
Current weather description	
Rainfall (During the last 24 hours)	
Air Temperature	
Humidity	
Wind speed & direction	
Water Temperature	
Water pH	
Dissolved Oxygen	
Nitrates	
Turbidity	

On the back of this sheet, sketch your creek site. Label places where water enters your site and locations of possible pollution sources.

Weather Data in the REAL World

Now that we have learned so much about weather, how will you use these concepts in everyday careers? Below is a list of jobs which are affected by the weather. Why do you think using a Kestrel will make each of these jobs easier and safer?



- | | |
|--------------------------------------|---------------------------------|
| Glider pilots | Arctic expedition teams |
| ESPN X Games participants | Storm chasers |
| Model airplane pilots | Firefighters |
| Rifle marksmen | St. Louis Rams Football players |
| SWAT teams | Demolition teams |
| Mountain Rescue Search teams | US Biathlon team |
| Police department (First responders) | Farmers |
| Drag racing | Combat troops in Iraq |

Choose ten of the jobs from the list above. Explain how weather can affect their job and how they can use a Kestrel to make good decisions.*

Jobs	Weather type	Kestrel use

* For extra help, go to the Kestrel website. (www.kestrelweather.com)
 Click on Kestrel Weather Instruments. Then click on Kestrel Applications to go to the Kestrel Library to look up the uses of the Kestrel.